MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology
Standard Reference Materials Program
Bldg. 202 Rm. 211
Gaithersburg, Maryland 20899

SRM Number: 935a
MSDS Number: 935a
SRM Name: Crystalline Potassium Dichromate
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SECTION I. MATERIAL IDENTIFICATION

Material Name: Crystalline Potassium Dichromate

Description: SRM 935a consists of crystalline potassium dichromate of established purity.

Other Designations: dichromic acid; dipotassium salt; potassium bichromate; dipotassium dichromate; bichromate of potash; iopezite; chromic acid; dipotassium salt

Name	Chemical Formula	CAS Registration Number
Crystalline Potassium Dichromate	$K_2Cr_2O_7$	7778-50-9

DOT Classification: Oxidizing Solid N.O.S., UN1479
Note: For this SRM there is a **Small Quantity Exemption.**

Manufacturer/Supplier: Available from a number of suppliers.

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Limits and Toxicity Data
Potassium Dichromate	~100 %	OSHA Ceiling Limit: 0.1 mg $(CrO_3)/m^3$
		OSHA TLV-TWA: 0.05 $(Cr)/m^3$
		NIOSH TLV-TWA: 0.001 $(Cr(VI))/m^3$
		Child, Oral: LD_{LO}: 26 mg/kg
		Rat, Oral: LD_{50}: 25 mg/kg
		Mouse, Oral: LD_{50}: 190 mg/kg
		Mouse, Subcutaneous: LD_{LO}: 100 mg/kg

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Potassium Dichromate
Appearance and Odor: An odorless, bright orange-red crystal with a bitter metallic taste.
Molecular Weight: 294.20
Density: 2.676
Boiling Point: 500 °C (decomposes)
Melting Point: 398 °C
Heat of Solution: -62.5 cal/g
Solubility in Water: Soluble.
Solubility in Other Compounds: Soluble in inorganic acids.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **Method Used:** N/A **Autoignition Temperature:** N/A

Flammability Limits in Air (Volume %): **UPPER:** N/A
LOWER: N/A

Extinguishing Media: Use water only. Do not use dry chemicals, carbon dioxide, or halogenated extinguishing agents.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full facepiece in the pressure-demand or positive-mode and other protective clothing.

Unusual Fire and Explosion Hazards: Potassium dichromate is a negligible fire hazard. This material is an oxidizer and may ignite or explode on contact with combustible materials.

SECTION V. REACTIVITY DATA

Stability: __X__ **Stable** _____ **Unstable**

Conditions to Avoid: Keep this material from excessive heat and incompatible materials.

Incompatibility (Materials to Avoid): This material is incompatible with metals, combustible materials, reducing agents, amines, cyanides, and bases.

See Section IV: *Unusual Fire and Explosion Hazards*.

Hazardous Decomposition or Byproducts: Thermal decomposition of potassium dichromate may release toxic and/or hazardous gases.

Hazardous Polymerization: _____ **Will Occur** __X__ **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: __X__ Inhalation __X__ Skin __X__ Ingestion

Health Hazards (Acute and Chronic): Concentrations of potassium dichromate above the regulated levels are immediately dangerous to life and health. Exposure to chromium dust and/or vapors may cause nasal irritation, lung irritation, coughing, labored breathing, wheezing, chest pain, ulceration and perforation of the nasal septum, pulmonary edema, jaundice, and liver and kidney damage. Continued exposure by this method can cause erosion and discoloration of the teeth, painless ulceration of the nasal septum, nose bleeds, and foul nasal discharge. An excess risk for lung and sinonasal cancer has been reported in workers in chromate production, chromate pigment production, and chromium industries.

Skin contact with potassium dichromate can cause painless, penetrating, slow healing lesions. Sensitization *dermatitis* has been reported, possibly due to the presence of chromium. Prolonged or repeated exposure may cause *eczematous dermatitis* with edema and ulceration that heals slowly. Prolonged or repeated contact with chromate may induce sensitization to chromium. Direct contact with the eye may cause irritation, redness, pain, tearing, conjunctivitis, and blurred vision.

Ingestion of soluble dichromate salts may cause violent gastroenteritis (inflammation of the lining membrane of the stomach and the intestines), diarrhea, peripheral vascular collapse, dizziness, muscle cramps, coma, *hemorrhagic diathesis* (an abnormal state with bleeding), fever, *hemmorhagic nephritis* (acute or chronic inflammation of the kidneys with bleeding), and acute renal failure. Prolonged or repeated ingestion is not likely to occur but may cause liver and kidney damage.

Potassium dichromate is recognized as a carcinogen. An evaluation on chromium (VI) compounds based on the combined results of epidemiological studies, carcinogenicity studies in experimental animals, and several types of other relevant data which support the underlying concept that chromium (VI) ions generated at critical sites in the target cells are responsible for the carcinogenic action observed.

Signs and Symptoms of Exposure: See Health Hazards (Acute and Chronic).

Medical Conditions Generally Aggravated by Exposure: N/A

Listed as a Carcinogen/Potential Carcinogen:

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens	X	
In the International Agency for Research on Cancer (IARC) Monographs	X	
By the Occupational Safety and Health Administration (OSHA)	X	

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Obtain medical assistance immediately.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 min. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance.

Ingestion: If ingestion occurs, wash out mouth with water. Obtain medical assistance immediately.

TARGET ORGAN(S) OF ATTACK: The skin, liver, kidneys, respiratory system and pulmonary system.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be taken in Case Material is Released or Spilled: Notify safety personnel of large leaks or spills. Remove sources of ignition. Do not touch spilled material. Small spills can be taken up with sand or other absorbent material and placed in a container for later disposal. Do not flush directly to sewer or surface waters.

Waste Disposal: Dispose of the material via internal safety office or licensed contractor. Follow all federal, state, and local regulations.

Handling and Storage: Those handling potassium dichromate should use full protective clothing and equipment to prevent body contact with the liquid. Use rubber gloves or gauntlets, apron, long-sleeved shirts, etc. An eyewash station, washing facilities, and safety shower must be readily available to areas of use and handling. Provide adequate exhaust ventilation to meet TLV requirements.

Note: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store containers in a clean, cool, well-ventilated area out of direct sunlight and away from oxidizing agents and sources of heat. Provide emergency neutralization materials and equipment near areas of storage and use.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS *Potassium Dichromate*, June 9, l998.
Hawley's Condensed Chemical Dictionary, 11th ed., 1987.
The Merck Index, 11th Ed., 1989.
Webster's Ninth New Collegiate Dictionary, 1990.
OSHS Chemical Sampling Information, Chromic Acid & Chromates,
http://www.osha.slc.gov/ChemSamp-data/CH-228600.html